

What is claimed is:

1. A composite material, comprising:

a) an epoxy resin formed from

a base portion comprising (i) a polymer of epichlorohydrin and bisphenol A and (ii) alkyl glycidal ether, and

a reactor portion comprising (i) aromatic alcohol, (ii) benzoic acid, 2 hydroxy, (iii) cycloaliphatic diamine, (iv) phenol-nonyl, and (v) polymer of epichlorohydrin and bisphenol A,

said base portion and said reactor portion provided in a two to one ratio; and

b) decorative elements dispersed within said resin,

wherein said resin is sufficiently transparent such that said decorative elements dispersed within said resin are visible.

2. A composite material according to claim 1, wherein:

said base portion comprises,

(i) 75-93 wt% polymer of epichlorohydrin and bisphenol A, and

(ii) 7-25 wt% alkyl glycidal ether, and

said reactor portion comprises,

(i) 15-35 wt% aromatic alcohol,

(ii) 3-10 wt% benzoic acid, 2 hydroxy,

(iii) 35-65 wt% cycloaliphatic diamine,

(iv) 4-15 wt% phenol-nonyl, and

(v) 0.5-2 wt% polymer of epichlorohydrin and bisphenol A.

3. A composite material according to claim 2, further comprising:

Perox Violet 3B.

4. A composite material according to claim 2, wherein:

said decorative element includes at least one of stones, pebbles, clay, rock, sand, gravel, dye, pigment, clay, wood, powder, paints, paint chips, pigment, beads, marbles, glass, glow-in-the dark materials, mulch, liquids, photographs, mesh, and figurative objects.

5. A composite material according to claim 1, wherein:

said decorative element includes at least one of stones, pebbles, clay, rock, sand, gravel, dye, pigment, clay, wood, powder, paints, paint chips, pigment, beads, marbles, glass, glow-in-the dark materials, mulch, liquids, photographs, mesh, and figurative objects.

6. A composite material according to claim 1, wherein:

said epoxy resin comprises at least a surface layer and an under layer, wherein said decorative element is absent from said surface layer.

7. A composite material according to claim 1, wherein:

said epoxy resin comprises at least two layers, and said decorative element is different in each of said at least two layers.

8. A composite material according to claim 1, wherein:

said material is waterproof and highly resistant to physical or chemical degradation.

9. A composite material according to claim 1, wherein:

said material experiences no shrinkage, contraction, or expansion over time.

10. A composite material according to claim 1, wherein:

said material is resistant to mild mineral acids, alkalis, detergents, solvents, skydrol, hydraulic fluids, lubricating oils, and salts.

11. An article, comprising:

a material comprising an epoxy resin formed from a base portion comprising (i) a polymer of epichlorohydrin and bisphenol A and (ii) alkyl glycidal ether, and a reactor portion comprising (i) aromatic alcohol, (ii) benzoic acid, 2 hydroxy, (iii) cycloaliphatic diamine, (iv) phenol-nonyl, (v) polymer of epichlorohydrin and bisphenol A, said base portion and said reactor portion provided in a two to one ratio, and decorative elements dispersed within said resin,

said resin being sufficiently transparent such that said decorative elements dispersed within said resin are visible,

wherein said article comprising the material is one of,

- i) furniture,
- ii) a surface for work, storage, display, or dividing space;
- iii) kitchenware;
- iv) a tray,
- v) a letter opener,
- vi) a vase,
- vii) a planter,
- viii) a lighting fixture,
- ix) a clock,
- x) a picture frame,
- xi) a coaster, and
- xii) a storage device.

12. An article according to claim 11, wherein:

said material further comprises Perox Violet 3B.

13. An article according to claim 11, wherein:

said epoxy resin comprises at least a surface layer and an under layer, wherein said decorative element is absent from said surface layer.

14. An article according to claim 11, wherein:

said epoxy resin comprises at least two layers, and said decorative element is different in each of said at least two layers.

15. A tile, comprising:

a cured epoxy resin comprised of a base portion of (i) a polymer of epichlorohydrin and bisphenol A and (ii) alkyl glycidal ether, and a reactor portion of (i) aromatic alcohol, (ii) benzoic acid, 2 hydroxy, (iii) cycloaliphatic diamine, (iv) phenol-nonyl, and (v) polymer of epichlorohydrin and bisphenol A, said base portion and said reactor portion provided in a two to one ratio, said resin molded in a form so as to have an upper generally planar surface; and

b) decorative elements dispersed within said resin,

wherein said resin is sufficiently transparent such that said decorative elements dispersed within said resin are visible.

16. A tile according to claim 15, wherein:

said tile is clear.

17. A tile according to claim 16, wherein:

said resin includes Perox Violet 3B.

18. A tile according to claim 15, wherein:

said surface area does not exceed approximately 144 inches square, and said tile has a thickness not exceeding approximately 0.5 inch.

19. A method of manufacturing a composite material, comprising:

- a) first pouring a mixture of a base portion and a reactor portion of an epoxy resin into a mold to form a first layer of the resin;
- b) allowing the first layer to at least partially cure;
- c) adding a plurality of decorative elements onto the at least partially cured first layer, wherein the decorative elements includes at least one of stones, pebbles, clay, rock, sand, gravel, dye, pigment, clay, wood, powder, paints, paint chips, pigment, beads, marbles, glass, glow-in-the dark materials, mulch, liquids, photographs, mesh, and figurative objects, and wherein no discrete decorative element covers the entirety of the first layer;
- d) second pouring a mixture of the base portion and the reactor portion of the epoxy resin into the mold to form a second layer of the resin over the first layer; and
- e) allowing the second layer to cure.

20. A method according to claim 19, wherein:

said allowing the first layer to at least partially cure includes curing for preferably six to twenty four hours.

21. A method according to claim 19, further comprising:

providing decorative elements into the first layer.

22. A method according to claim 19, further comprising:

after the second layer is partially cured, third pouring a mixture of the base portion and the reactor portion of the epoxy resin into the mold to form a third layer of the resin over the second layer.

23. A method according to claim 22, further comprising:

providing decorative elements in the third layer.

24. A method according to claim 19, further comprising:

prior to adding the plurality of decorative elements onto the at least partially cured first layer, sanding the first layer.

25. A method according to claim 19, wherein:

the reactor portion comprises,

(i) aromatic alcohol,

(ii) benzoic acid, 2 hydroxy,

(iii) cycloaliphatic diamine,

(iv) phenol-nonyl,

(v) polymer of epichlorohydrin and bisphenol A.

26. A method according to claim 25, wherein:

the reactor portion comprises,

(i) 15-35 wt% aromatic alcohol,

(ii) 3-10 wt% benzoic acid, 2 hydroxy,

(iii) 35-65 wt% cycloaliphatic diamine,

(iv) 4-15 wt% phenol-nonyl,

(v) 1-2 wt% polymer of epichlorohydrin and bisphenol A.

27. A method of manufacturing a composite material, comprising:

- a) first pouring a mixture of a base portion and a reactor portion of an epoxy resin into a mold to form a first layer of the resin;
- b) first providing a plurality of decorative elements into the first layer;
- c) at least partially curing the first layer;
- d) second pouring a mixture of the base portion and the reactor portion of the epoxy resin into the mold to form a second layer of the resin over the first layer; and
- e) allowing the second layer to cure.

28. A method according to claim 27, wherein:

said providing a plurality of decorative elements includes one of,

- i) mixing the decorative elements into the mixture prior to said pouring, and
- ii) adding the decorative elements to the layer after said pouring.

29. A method according to claim 27, further comprising:

removing the cured resin from the mold.

30. A method according to claim 27, wherein:

the mixture includes a reactor portion comprising,

- (i) 15-35 wt% aromatic alcohol,
- (ii) 3-10 wt% benzoic acid, 2 hydroxy,
- (iii) 35-65 wt% cycloaliphatic diamine,
- (iv) 4-15 wt% phenol-nonyl,
- (v) 1-2 wt% polymer of epichlorohydrin and bisphenol A,

wherein the base portion and reactor portion are provided in a two to one ratio.

31. A method according to claim 27, further comprising:

second providing a decorative element onto the first layer after at least partially curing the first layer.

32. A method according to claim 19, further comprising:

removing the cured resin from the mold.

33. An epoxy resin composite material, comprising:

a) a first layer of an epoxy resin molded in a form so as to have an upper generally planar front surface with a length and height;

b) a plurality of decorative elements of a first size dispersed within said first layer resin, each of said decorative elements having a length and height substantially smaller than said first layer;

c) a second layer of an epoxy resin coupled to said first layer and forming a back surface of said material; and

d) a plurality of decorative elements of a second size dispersed within said second layer resin, said second size being smaller than said first size,

wherein said first layer is sufficiently transparent such that said decorative elements in said second layer are visible therethrough.



34. An epoxy resin composite material according to claim 33, wherein:

said decorative elements of said second size are even dispersed throughout said second layer.

35. An epoxy resin composite material according to claim 33, wherein:

an intervening epoxy resin layer is provided between said first and second layers.

36. An epoxy resin composite material, comprising:

a) a first layer of an epoxy resin molded in a form so as to have an upper generally planar front surface with a length and height;

b) a plurality of first decorative elements of a first size dispersed within said first layer resin, each of said decorative elements having a length and height substantially smaller than said first layer;

c) a second layer of an epoxy resin coupled to said first layer and forming a back surface of said material; and

d) a second decorative element mixed within said second layer resin,

wherein said first layer is sufficiently transparent such that said decorative element in said second layer is visible therethrough.

37. An epoxy resin composite material according to claim 36, wherein:

said second decorative element is evenly dispersed within said second layer.

38. An epoxy resin composite material according to claim 36, wherein:

an intervening epoxy resin layer is provided between said first and second layers.

39. A method of manufacturing a composite material, comprising:

- a) first pouring a mixture of a base portion and a reactor portion of an epoxy resin into a mold to form a first layer of the resin;
- b) allowing the first layer to at least partially cure;
- c) adding a decorative element onto the at least partially cured first layer, wherein the decorative element includes at least one of stones, pebbles, clay, rock, sand, gravel, dye, pigment, clay, wood, powder, paints, paint chips, pigment, beads, marbles, glass, glow-in-the dark materials, mulch, liquids, photographs, mesh, and figurative objects;
- d) second pouring a mixture of the base portion and the reactor portion of the epoxy resin into the mold to form a second layer of the resin over the first layer;
- e) allowing the second layer to cure; and
- f) removing the cured resin from the mold.